

GILMORE, LONG, AND MOSS LAKES  
HILLENBRAND FISH AND WILDLIFE AREA  
Greene County  
2005 Fish Management Report

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## EXECUTIVE SUMMARY

- Gilmore Lake is an interesting 4-acre body of water with a variegated shoreline and narrow secluded channels between spoil mounds. Gilmore Lake offers fair to good fishing opportunities for bluegill, largemouth bass, and redear. Growth and size structure of all three species is consistent with strip pits.
- Long Lake is an 8-acre pit with a steep gravel ramp and drops off to a depth of 19 ft at the waters edge. Coontail and Eurasian watermilfoil dominate the narrow littoral zone. Long Lake offers fair to good bass and bluegill fishing. Growth and size structure is consistent with strip pits.
- Moss Lake is 20-acre impoundment with high conductivity. There is ample shoreline fishing, however dense vegetation growth in the extended shallow areas may prevent access early in the season. The gravel ramp is a shallow launch. Bluegill greater than 6 in accounted for 50% of bluegill collected and largemouth bass also provide good fishing opportunities. The Department of Natural Resources should continue vegetation control efforts at Moss Lake to maintain bass and bluegill size structure.

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## INTRODUCTION

Hillenbrand Fish and Wildlife Area is located near the town of Midland off of State Road 59 in Greene County, Indiana. The property is managed under Minnehaha Fish and Wildlife Area. It was purchased by the Division of Fish and Wildlife in 1995. Hillenbrand Fish and Wildlife Area consists of approximately 3,400 acres of mostly reclaimed surface mine land as well as some areas that have not been mined. There are over 20 lakes on the property totaling more than 170 acres of water which are capable of supporting fish (Figure 1). The bodies of water vary considerably in both size and productivity (Schoenung 1998).

Gravel boat ramps are present at Beaver Dam, Front, East, Moss, Long, Gilmore and Crystal Lakes. The smaller, more remote lakes lack boat access. Only electric motors are permitted on all Hillenbrand FWA lakes. Anglers may also fish from the shoreline at many of the lakes.

This survey at Hillenbrand Fish and Wildlife Area includes Long and Gilmore Lakes, both reclaimed surface mines, and Moss Lake, an impoundment. Gilmore and Long lakes were last surveyed during the initial assessment of 10 bodies of water on the property in 1995. Moss was last surveyed in 1997. Moss Lake has been under a vegetation management plan since 1998 to increase bass and bluegill size.

## METHODS

A standard fish survey was conducted at Gilmore (Figure 2), Long (Figure 3), and Moss (Figure 4) lakes from June 20 to 22, 2005. Sampling effort at each body of water consisted of 0.5 h of pulsed DC night electrofishing with two dippers and one experimental gill net set. Four trap nets were set at Moss Lake and two each at Gilmore and Long Lakes. Fish were measured to 0.1 in TL. Scale samples were taken from game species for age and growth analysis. District averages were used to estimate fish weight. Proportional Stock Density (PSD) was calculated for largemouth bass and bluegill (Anderson and Neumann 1996). Water chemistry parameters were measured according to the Manual of Fisheries Survey Methods (Shipman, et al. 2001).

Tier II aquatic vegetation sampling was conducted on July 19, 2005, according to Pearson (2003). A GPS unit was used to record the location of the limnological data and fish collection sites.

## RESULTS

### Gilmore Lake

Water chemistry parameters were normal for this surface mine lake. The Secchi disk reading was 7 ft 7 in and dissolved oxygen (D.O.) was adequate for fish survival to a depth of 6 ft. The aquatic vegetation survey found four species of submersed vegetation to a maximum depth of 15 ft. Coontail dominated the population with a site frequency of 82. Eurasian watermilfoil was found at a frequency of 41. Chara, water stargrass, and filamentous algae were also documented.

A total of 139 fish representing largemouth bass, bluegill, and redear was collected during the survey for an estimated weight of 29 lb. Bluegill dominated the catch by number (61%) followed by largemouth bass (31%), and redear sunfish (8%). By weight, largemouth bass ranked first (76%), followed by bluegill (16%), and redear (7%).

The bluegill sample consisted of 85 fish ranging from 1.3 to 7.3 in TL. The electrofishing catch rate was 152.0 bluegill/h. The PSD was 16. Bluegill greater than 6 in accounted for 10.5 % of bluegill collected. Bluegill growth was average.

A total of 43 largemouth bass was collected ranging from 1.2 to 14.9 in TL. The electrofishing catch rate was 82.0 bass/h. The bass PSD was 29. Bass growth was below average for ages 1 through 5.

The 11 redear collected ranged from 3.9 to 8.2 in TL, and from three to seven years old. The electrofishing catch rate was 22.0 redear/h. Redear growth was below average.

### Long Lake

Water chemistry parameters were normal for this surface mine lake. The surface pH was 10.1. The water was brown in color and the Secchi disk reading was 4 ft 9 in. The D.O. was adequate for fish survival to a depth of 8 ft. The aquatic vegetation survey found three species of submersed vegetation to a maximum depth of 15 ft. Coontail was dominant with a site frequency of 89, followed by Eurasian watermilfoil with a site frequency of 74. Filamentous algae was collected at 37% of the sites and chara was also collected.

A total of 121 bass and bluegill was collected during the survey for an estimated total weight of 55 lb. Bluegill dominated the catch by number (55%) followed by largemouth bass (45%). By weight, largemouth bass ranked first (91%), followed by bluegill (9%).

The bluegill sample consisted of 67 fish ranging from 2.2 to 8.3 in TL. The electrofishing catch rate was 70.0 bluegill/h. The PSD was 25. Bluegill greater than 6 in accounted for 36% of bluegill collected. Bluegill growth was average from age 1 to age 3 and above average at age 4.

A total of 54 largemouth bass was collected ranging from 1.5 to 20.8 in TL. The electrofishing catch rate was 106.0 bass/h. The bass PSD was 40. Growth was above average for ages 1 through 4 and average thereafter.

### Moss Lake

Water chemistry parameters were normal for this impoundment with the exception of a high conductivity of 1550  $\mu S$ . The water was brownish-green in color. The Secchi disk reading was 3 ft 6 in and D.O. was adequate for fish survival to a depth of 6 ft. The aquatic vegetation survey found three species of submersed vegetation to a maximum depth of 9 ft. Coontail was dominant with a site frequency of 94, followed by curlyleaf and sago pondweeds, each with a site frequency of 63. Filamentous algae was collected at 21% of the sample sites.

A total of 72 fish was collected during the survey for an estimated total weight of 38 lb. Bluegill dominated the catch by number (67%) followed by largemouth bass (32%). By weight, largemouth bass ranked first (77%), followed by bluegill (23%). One warmouth was collected.

The bluegill sample consisted of 48 fish ranging from 0.7 to 9.2 in TL. The electrofishing catch rate was 56.0 bluegill/h. The PSD was 54. Bluegill greater than 6 in accounted for 50% of bluegill collected. Bluegill growth was average at all age groups.

A total of 23 largemouth bass was collected ranging from 1.2 to 16.5 in TL. The electrofishing catch rate was 44.0 bass/h. The bass PSD was 81. Growth was above average at age 2 and average thereafter. Only one age-4 and two age-5 bass were collected.

## DISCUSSION

### Gilmore Lake

Gilmore Lake is an interesting 4-acre body of water with a variegated shoreline and narrow secluded channels between spoil mounds (Figure 2). The gravel ramp is directly off of C.R. 650 N. There are shallow vegetated and deeper open areas vegetated with chara. Shoreline fishing is limited and boat passage is likely restricted in some of the far channels with

fluctuations in water level and vegetation densities. Gilmore offers fair to good fishing opportunities for bluegill, largemouth bass, and redear. Growth and size structure of all three species is consistent with strip pits.

### Long Lake

Long Lake is an 8-acre pit that stretches from east to west off of C.R. 600 N. The lake is mostly open water with a well vegetated shoreline. The gravel ramp is steep. A couple feet into the lake the water drops off to a depth of 19 ft. Coontail and Eurasian watermilfoil were collected to a depth of 15 ft and dominated the narrow littoral zone. Conductivity has dropped from 712  $\mu S$  in 1995 to 510  $\mu S$  during this survey. The channel leading to the northern most section of the lake was narrow and shallow, 2 to 3 ft deep. Long Lake is bordered with thickets rendering shoreline fishing difficult. Catch rates are not comparable to the previous spot check because electrofishing was conducted during the day. Long Lake offers fair to good bass and bluegill fishing.

### Moss Lake

Moss Lake is 20-acre impoundment accessible from C.R. 650 N, approximately 1 mi east of Gilmore. There is ample shoreline fishing opportunities. The ramp is shallow resulting in difficulty launching and trailering boats. The water level is being maintained approximately 3.5 ft higher by a beaver dam on the southeast corner of the lake, otherwise the fishery would not be sustainable (Schoenung 1998).

Treatment of excessive vegetation, primarily Eurasian watermilfoil, began annually at Moss Lake in 1998 through 2000 with Sonar A.S.®. The treatments appeared to be successful. Milfoil has not been noted since 2000. However, curlyleaf pondweed was first documented in 2000. Since 2003, curlyleaf has been targeted for control with Aquathol K®. Results have been good. Brittle naiad was observed for the first time in this survey. Eurasian watermilfoil and American pondweed were not collected in this survey.

Good numbers of adult bluegill were collected via electrofishing at Moss Lake. Trap nets collected 25% of the total catch below 5 in. The largemouth bass PSD was 81 but was likely inflated due to reduced efficiency of electrofishing gear in high conductivity waters. Annual

submergent vegetation control should continue in order to maintain bass and bluegill size structure.

#### RECOMMENDATIONS

- The Department of Natural Resources should continue vegetation control efforts at Moss Lake to maintain gains in bluegill size structure.

#### LITERATURE CITED

- Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries Techniques, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.
- Andrews, S. J. Initial Fisheries Survey Results for Ten Lakes on the Hillenbrand Fish and Wildlife Area. 1995 Fish Management Report. Indiana Department of Natural Resources, Indianapolis, IN. 15pp.
- Pearson, J. 2003. Aquatic plant sampling guidelines. Indiana Department of Natural Resources, Division of Fish and Wildlife, Fisheries Section, Indianapolis, IN.
- Schoenung, B. M. Fisheries Survey Results and Management Plan for Nine Lakes on the Hillenbrand Fish and Wildlife Area. 1997 Fish Management Report. Indiana Department of Natural Resources, Indianapolis, IN. 78pp.
- Shipman, S., E. Braun, D. Carnahan, L. Koza, B. Schoenung, D. Keller, D. Kittaka, and T. Stefanavage, 2001. Manual of Fisheries Survey Methods. Indiana Department of Natural Resources, Indianapolis, IN. 67pp.

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Figure 1. Hillenbrand Fish and Wildlife Area, Greene County, Property Map 2005.

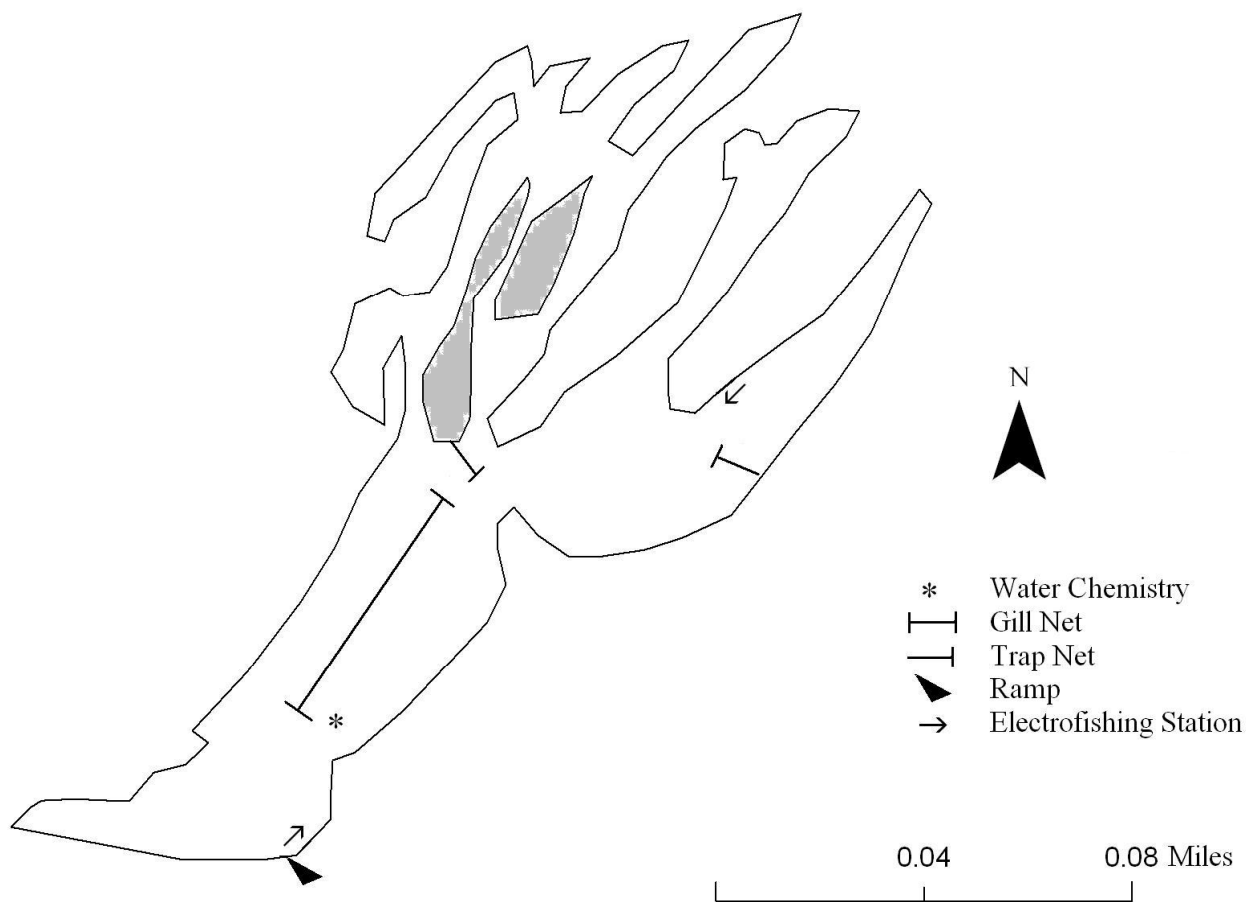


Figure 2. Gilmore Lake, HFWA, Greene County. Location of water chemistry, gill net, trap nets and electrofishing stations, 2005.

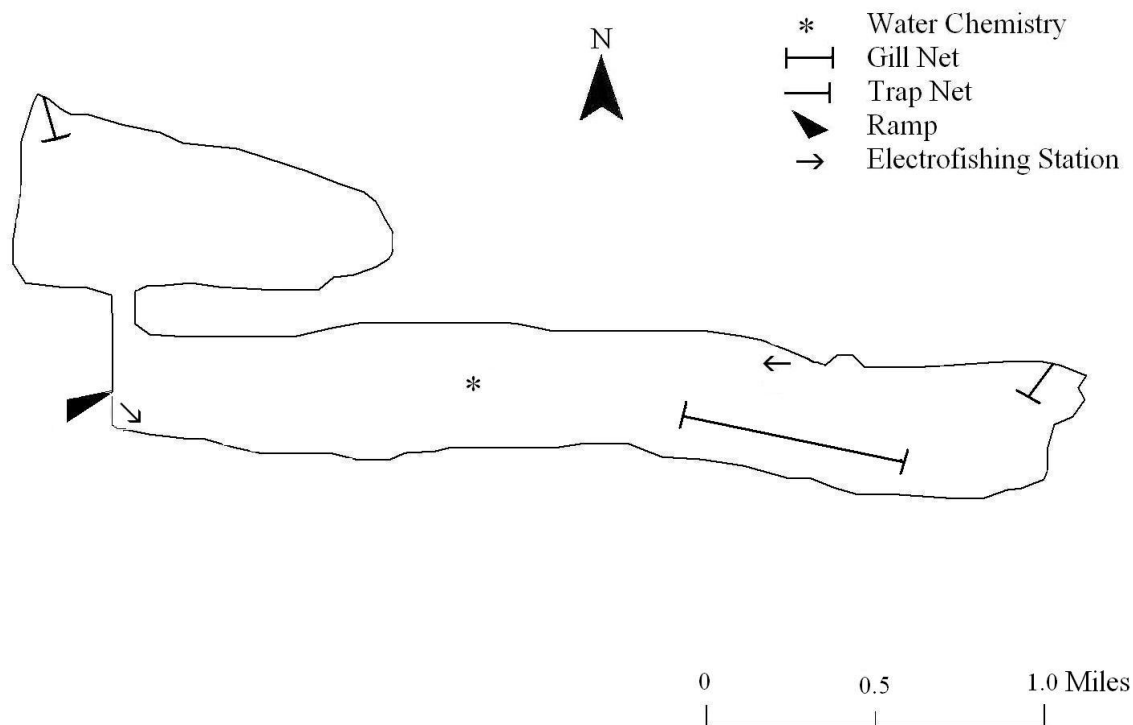


Figure 3. Long Lake, HFWA, Greene County. Location of water chemistry, gill net, trap nets and electrofishing stations, 2005.

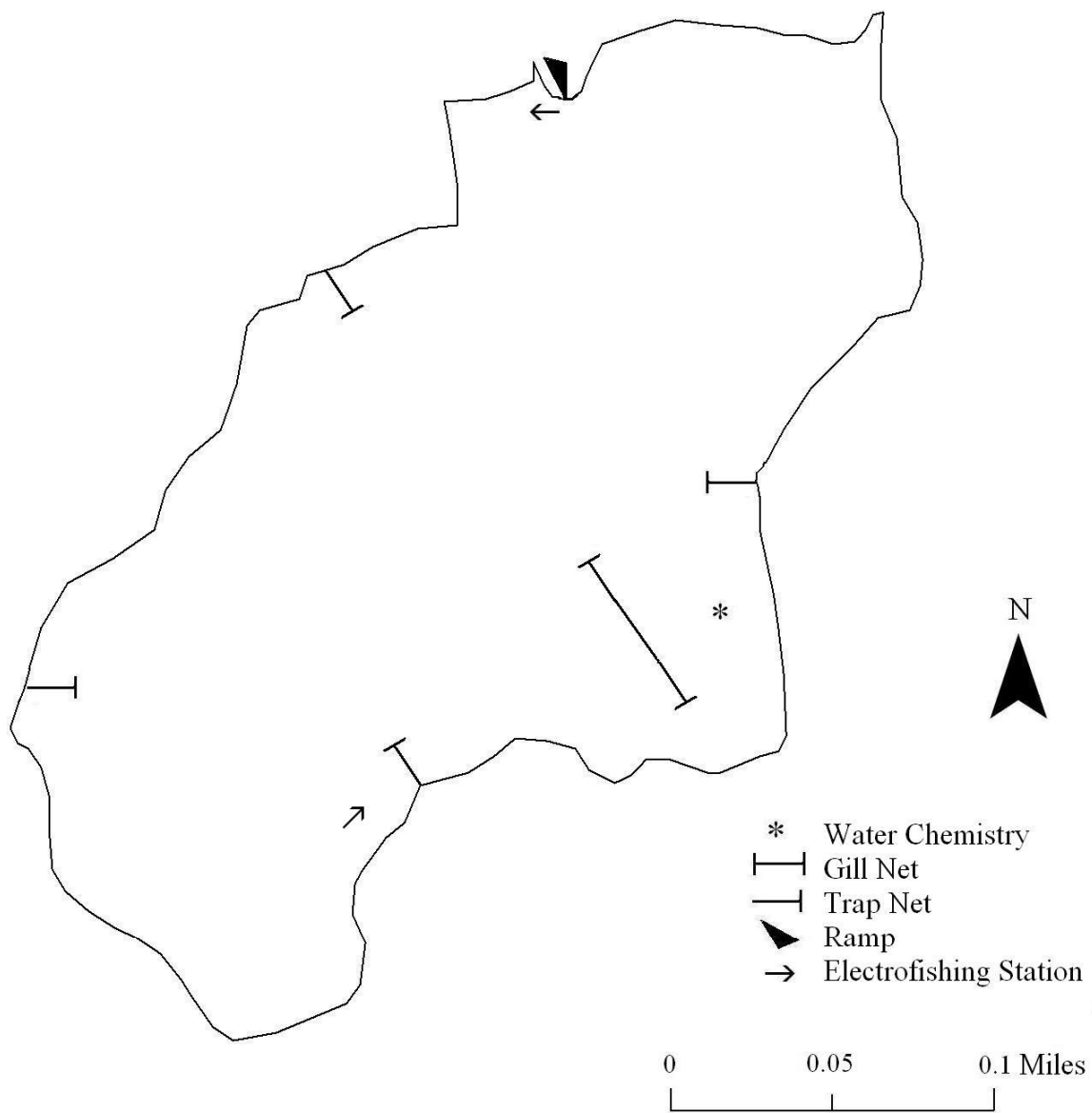


Figure 4. Moss Lake, HFWA, Greene County. Location of water chemistry, gill net, trap nets and electrofishing stations, 2005.